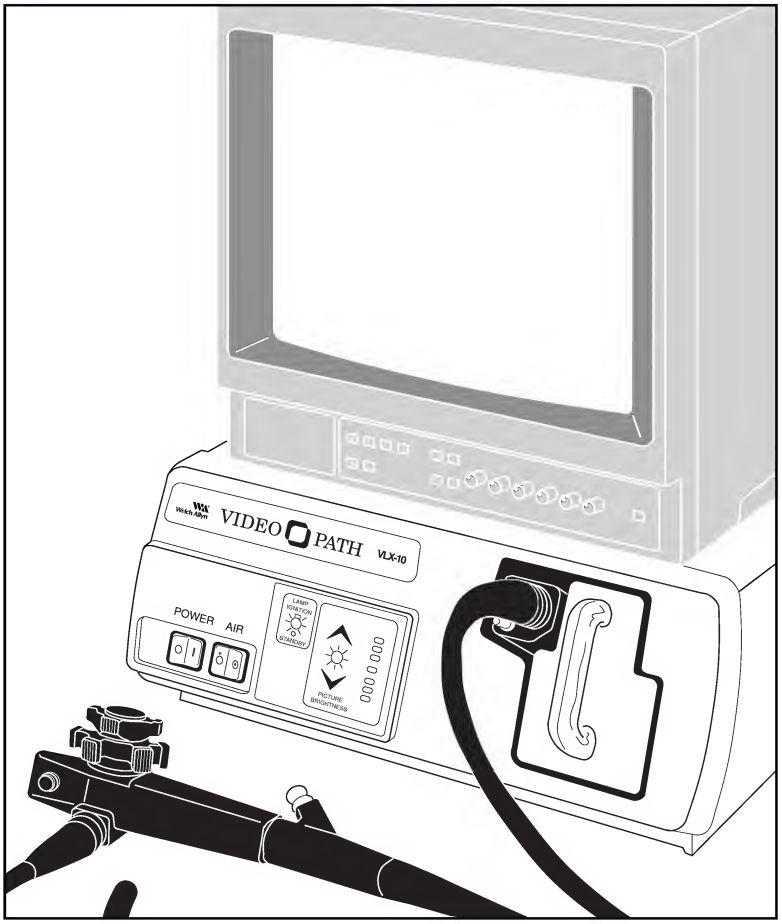
Welch Allyn®

VideoPath® VLX-10
Light Source



Operating Manual

Thank you for purchasing the Welch Allyn VideoPath VLX-10 Light Source. The operating and maintenance instructions found in this manual should be followed to ensure many years of reliable service. Please read these instructions thoroughly before attempting to use your new VLX-10 Light Source.

IMPORTANT: The material outlined in this manual should be reviewed and understood prior to operation of the equipment.

CAUTION: Federal Law restricts this device to sale by/to or on the order of a physician or other appropriately licensed medical professional.

WARNING: The user of this equipment should be thoroughly trained in the medical procedures appropriate to the instrumentation. Furthermore, time should be taken to read and understand these instructions before performing any procedures. Instructions for other equipment used in conjunction (e.g., suction machines) should also be read and understood. Failure to do so may result in injury to the patient and/or damage to the instrument.

Table of Contents

Conventions
- General Precautions 2
- Symbols 3

Specifications 4

Components 5
- VLX-10 Light Source 5
- Optional Accessories 5

Nomenclature
- Light Source Front Panel 6
- Light Source Bottom View 7
- Water Bottle/Cleaning Bottle 7
- Light Source Back View 8
- Monitor 9-10

Connection Diagrams 11

Preparation For Use
- General Precautions 12
- Setting Up the VLX-10 Light Source 13
- Connecting the VideoEndoscope and Water Bottle 13-14

Inspection
- Powering Up the Light Source 14
- Lamp Ignition 15
- Inspection of Illumination 15
- Inspection of Air/Water Feed 16

Operation
- Power Switch 17
- Lamp Ignition 17
- Illumination Brightness 17
- Air Pump 17

Maintenance and Storage
- After Each Procedure 18
- Water Bottle Cleaning 18
  - Enzymatic Solutions 18
- Water Bottle Sterilization 19
- ETO Sterilization 19
- Cold Sterilization 20
- Sterilizing/Disinfecting Solutions 20
- Bottle Storage 20
- Replacing Lamps 21-22
- Light Source Storage 23

Troubleshooting 24

Conventions

WARNING: Alerts the user to possible serious injury, death or other adverse reaction associated with the use or misuse of the device.

CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It also alerts against unsafe practices.

NOTE: Provides supplemental information to the text and indicates a potentially hazardous situation, which, if not avoided, may result in property damage. Additionally it highlights important information on the use of this equipment.

General Precautions

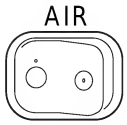
- For safety, this light source should only be coupled to a grounded 110-120V AC outlet (hospital grade receptacle).
- The light source should not be operated in the presence of flammable or explosive gases or chemicals or installed in areas where these materials are commonly utilized.
- To avoid overheating, the light source should be positioned on a hard, level surface and the back of the light source should not be positioned closer than 6" to any wall.
- Keep all liquids away from electrical equipment to avoid the possibility of operator shock and instrument damage.
- Occasionally inspect the power cord for signs of cuts, abrasions or dents.
- The light source should never be stored or operated in areas where it could get wet or exposed to any environmental conditions such as extreme temperature, humidity, direct sunlight, dust, etc.
- All service to the light source must be performed by Welch Allyn or an authorized repair center.
- The light source and connected endoscope should not be used with electrosurgical generators. The VideoSigmoidoscope system has not been designed for therapeutic procedures.
- Light source use should adhere to the operating conditions found in this manual. Otherwise, instrument damage may occur and/or operator/patient safety compromised.

Conventions (Continued)

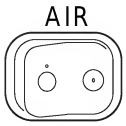
Symbols

Off: (Power: disconnects from the mains)

On: (Power: connects to the mains)



Off: (Power for air switch)



On: (Power for air switch)

Attention: Consult user's manual for additional information

Dangerous voltage

Protective earth (ground)

Risk of Explosion

Caution High Temperatures

Type B Equipment

Warning: Risk of fire, replace fuses as marked

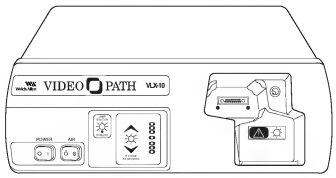
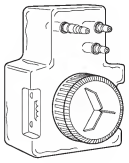
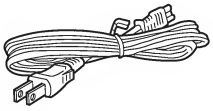
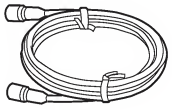
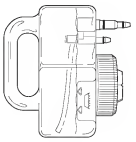
Caution: High Intensity Light

Specifications

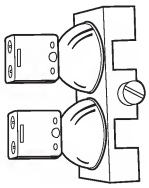
Item	Specification	Technical Data
Power Requirements	Voltage Frequency Current	115VAC 50/60Hz 2.0 Amps Max.
Dimensions	H x W x D Weight	7 x 17 x16-1/2 (18 x 43 x 42cm) 15.0 lbs. (6.8 kg)
Operating Environment	Ambient Temperature Relative Humidity Atmospheric Pressure	+10° C (50° F) to +40°C (104° F) 30-75% 700 hPa to 1060 hPa
Illumination	Lamp Type Lamp Life (average) Brightness Adjustment Cooling Method	Metal Halide Arc 750 hrs @ 1 hr per start Automatic Shutter Forced Air
Air Feeding	Pump Type Capacity Flow Rate Control	Linear Motor, Free Piston 6.5 PSIG Maximum .177 c.f.m. @ 2.84 PSIG Power switch activated
Water Feed System	Water Compression Watter Bottle Capacity	Pressurized by pumped air 260 ml
Compatible Endoscopes	Welch Allyn VideoEndoscopes Other Manufacturer's Fiberscopes	Color CCD only All models with use of video adapter module (not presently available)
Color System	Color mosaic CCD	
Video Outputs	Composite (NTSC) and Y/C (SVHS)	
Output Devices	VCR Monitor Thermal or Video Printer	
Compliance	Designed in Accordance Degree of explosion proofing	UL 2601 Use in potentially flammable surroundings prohibited
Classification	Electro medical equipment Degree of protection against electrical shock	Class I Equipment, 3 prong plug Type B, use on heart is prohibited
Fuse	T2.0A-250V	
Lamp	Welch Allyn Part No. 04060	Lamp Voltage 60 Volts

Components

VLX-10 Light Source Includes:

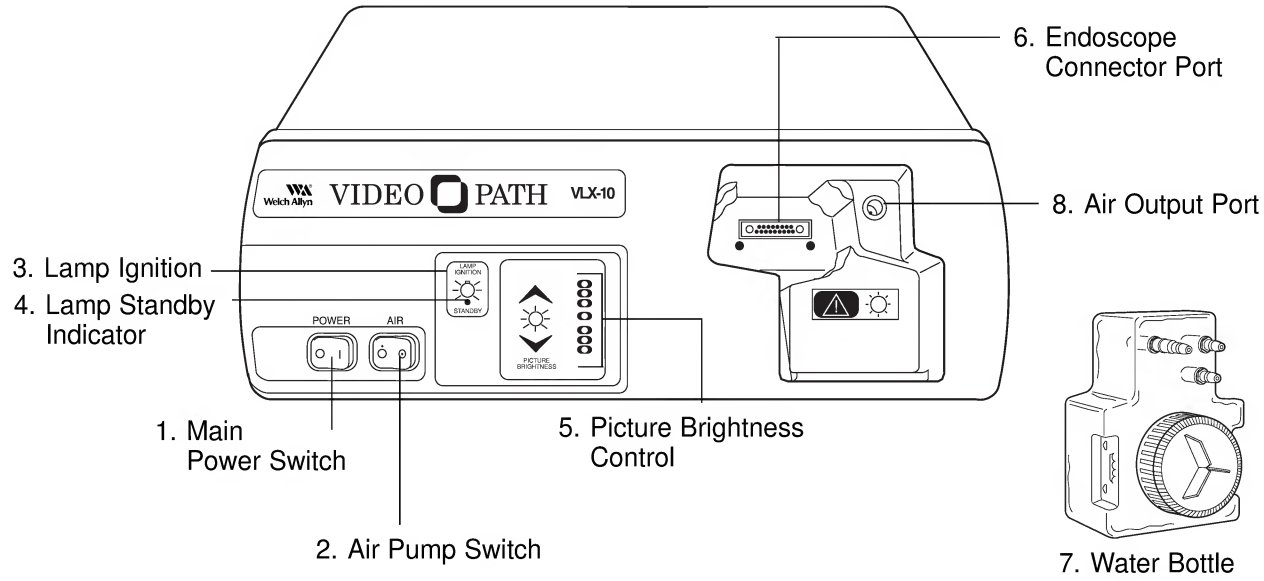
	**40500**	Light Source
	**45510**	Water Bottle
	**761076-0**	Power Cord
	**45512**	S-VHS Video Cable
	**45520**	Cleaning/Disinfection Bottle

Optional Accessories

	**04060**	Lamp Replacement Assembly

Nomenclature

Light Source Front Panel

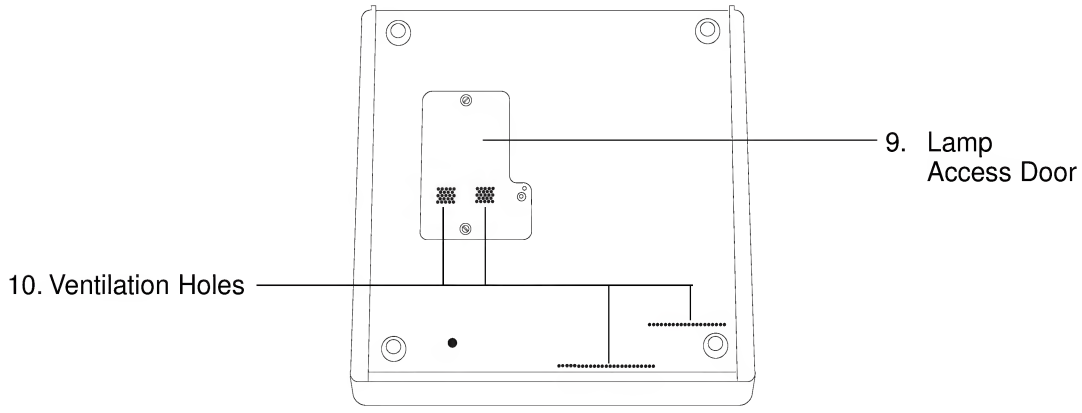


Front Panel

Name	Function
1. Main Power Switch	Primary power control for the light source. If not activated, other controls will not function.
2. Air Pump Switch	Activates flow of air at air output port in endoscope connector port.
3. Lamp Ignition	Ignites and activates the lamps.
4. Lamp Standby Indicator	When LED blinks, lamps cannot be ignited. When LED remains on, lamps have warmed up/cooled down and can be ignited.
5. Picture Brightness Control	Pressing up or down arrows adjusts image on monitor to desired brightness level (level indicated by illuminated green LED)
6. Endoscope Connector Port	Accepts endoscope connector terminal to transmit light and electrical signals through the endoscope.
7. Water Bottle	Water bottle couples to endoscope connector terminal's air and water input ports and light source air output port.
8. Air Output Port	Couples to and pressurizes the water bottle which provides air and water to the endoscope.

Nomenclature (Continued)

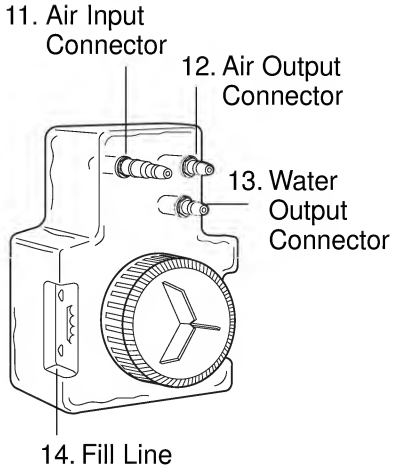
Light Source Bottom View



Light Source Bottom View

Name	Function
9. Lamp Access Door	Opens for lamp replacement. (Note: If door is not properly closed, interlock power switch will deactivate and the unit will not power up.)
10. Ventilation Holes	Allows air to enter unit to cool internal components.

Water Bottle/Cleaning Bottle



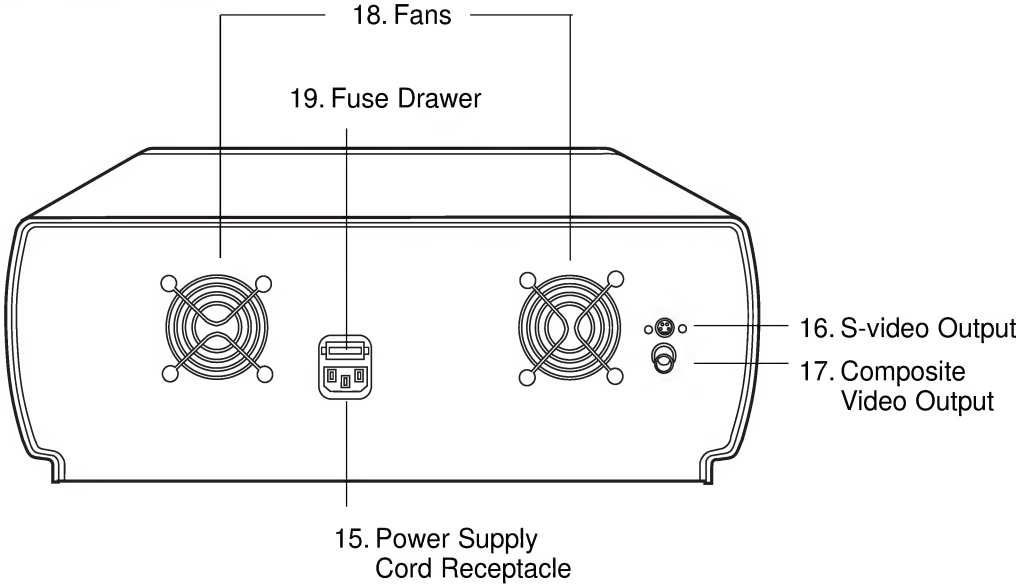
Water Bottle

Name	Function
11. Air Input Connector	Couples to light source air output port.
12. Air Output Connector	Couples to endoscope air input port.
13. Water Output Connector	Couples to endoscope water input port.
14. Fill Line	Indicates maximum water level to which bottle should be filled for normal use.

NOTE: Cleaning bottle is identical to water bottle with the exception that it allows fluid to be introduced into the air input port of the endoscope. The bottle can be easily identified via the red **CAUTION** label on the front of the bottle.

Nomenclature (Continued)

Light Source Back View



Light Source Back View

Name	Function
15. Power Supply Cord Receptacle	Couples with power cord which should be plugged into a 110-120 VAC hospital grade outlet.
16. S-video Output	Outputs S-video or Y/C, 4 position Mini-DIN.
17. Composite Video Output	Outputs NTSC (composite video), BNC connector.
18. Fans	Pulls room air into the light source for forced air cooling.
19. Fuse Drawer	Opens for replacement of main fuse.

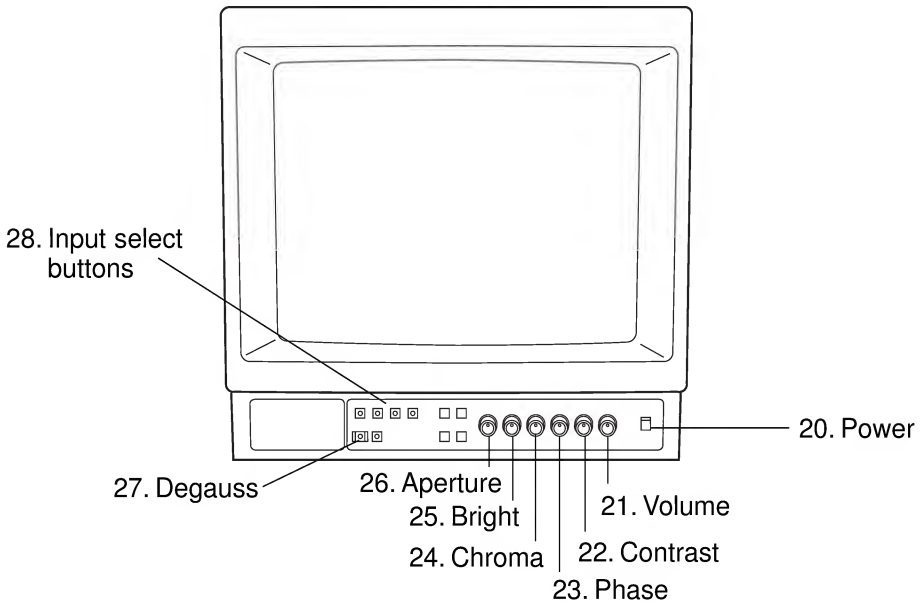
Nomenclature (Continued)

Monitor

NOTE: The following is a brief overview of the nomenclature of the SONY PVM-1350 Video Monitor. For detailed instructions, please refer to the Operation Manual that is provided by the manufacturer.

PLEASE REFERENCE YOUR SONY MONITOR MANUAL ENCLOSED FOR FURTHER INFORMATION.

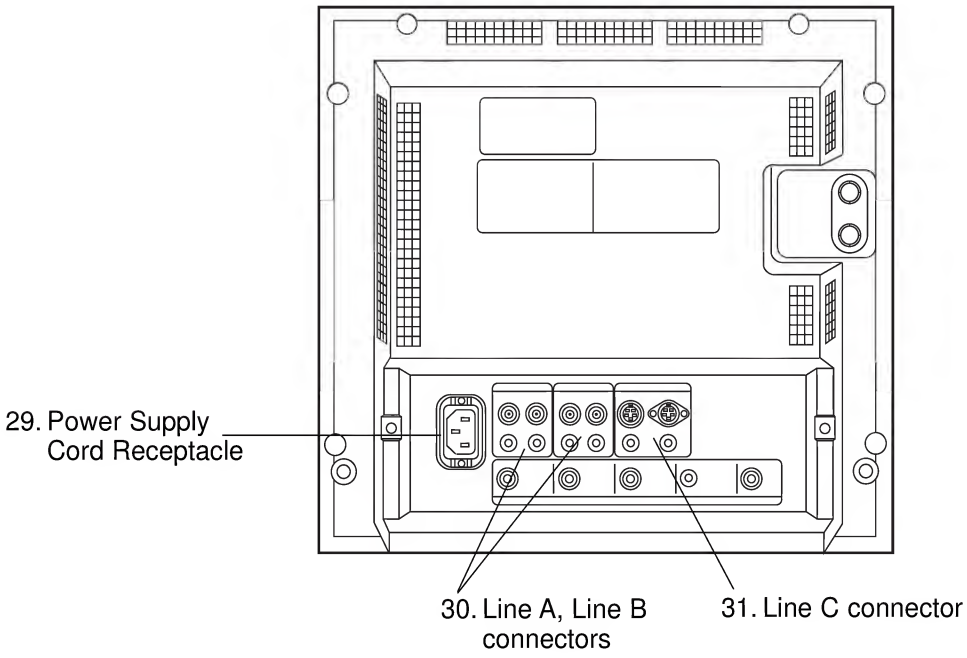
Front Panel of Monitor



Name	Function
20. Power	Depress to turn the monitor on. The indicator will light up in green.
21. Volume	No function.
22. Contrast	Turn clockwise to increase contrast and counterclockwise to decrease it.
23. Phase (Tint)	Turn clockwise to make the skin tones greenish and counterclockwise to make them purplish.
24. Chroma	Turn clockwise to make the color intensity higher and counterclockwise to make it lower.
25. Bright (Brightness)	Turn clockwise for more brightness and counterclockwise for less.
26. Aperture (Sharpness)	Turn clockwise for more sharpness and counterclockwise for less.
27. Degauss button	Press this button momentarily. The screen will be demagnetized. Wait for 10 minutes or more before activating this button again.
28. Input select buttons	Press (light on) to select the program to be monitored. **A:** For signal fed through the LINE A connectors. **B:** For signal fed through the LINE B connectors. **C:** For signal fed through the LINE C connectors. **RGB:** For signal fed through the RGB connectors.

Nomenclature (Continued)

Back Panel of Monitor

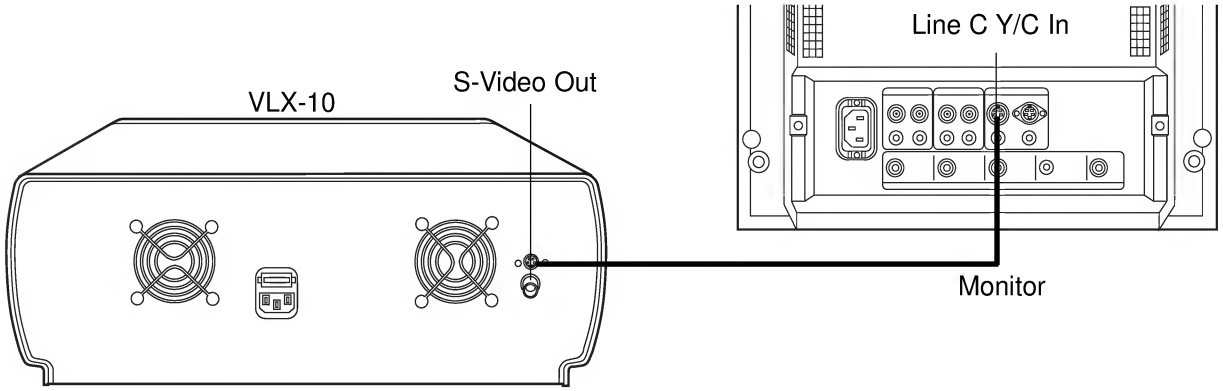


Name	Function
29. Power Supply Cord Receptacle	Couples with power cord, which should be plugged into a 110-120 VAC hospital grade outlet.
30. Line A, Line B connectors	Two groups (A and B) of line input connectors for composite video.
31. Line C connector Y/C IN (S-Video)	High resolution S-Video input.

Connection Diagrams

Connecting the VLX-10 with Monitor

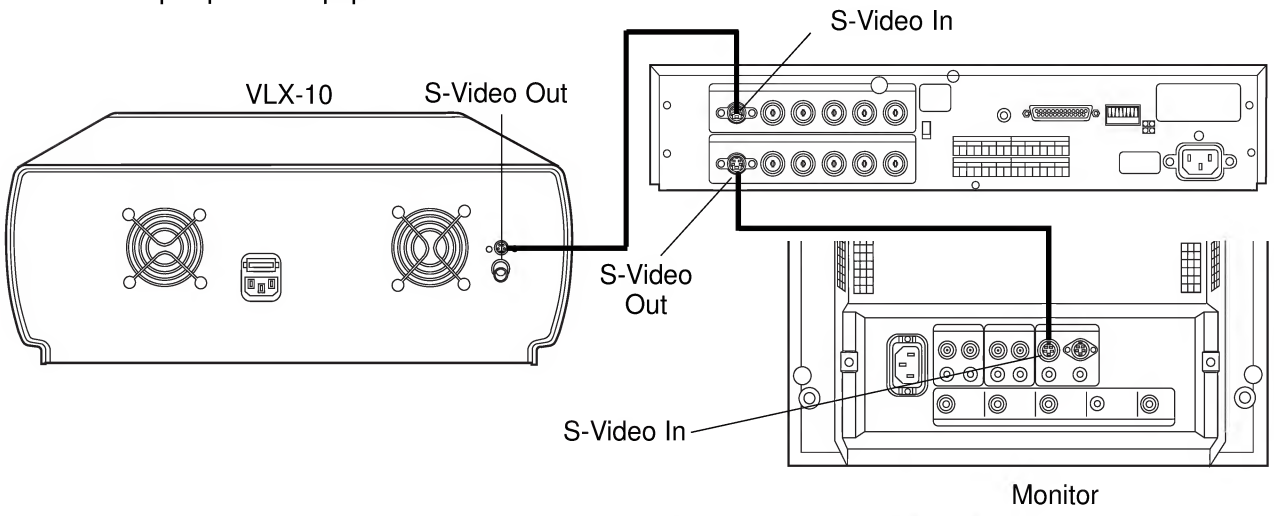
The diagram below illustrates an example of recommended coupling between the VLX-10 and a monitor.



Connection to monitor diagram

Connecting the VLX-10 with VCR/Video Printer

The diagram below illustrates an example of recommended coupling between the VLX-10 and peripheral equipment.



Connection of the VLX-10 with VCR/Video Printer

WARNING: All video monitors and peripheral equipment used with this system must be UL-544 (or UL 2601) listed to comply with medical electrical safety guidelines. If not UL-544 (UL-2601) listed, the monitor/peripheral equipment should be positioned outside of the 6 foot patient contact area. Please contact Welch Allyn for more information.

Preparation For Use

General Precautions

- Make sure the cabinet of this unit is always grounded and secure during use. Do not disable line cord ground connection. Grounding reliability is achieved only when light source is connected to “hospital-use” or “hospital-grade” receptacle. Inspect the electrical plug and cord routinely. Do not use if damage is discovered.

- Do not use the light source in the presence of any flammable anesthetics.

- Do not open the light source cabinet. There is an electrical shock hazard due to the high internal voltage.There are no user serviceable parts inside the light source.

NOTE: Opening of the light source cabinet by a non-authorized repair facility will void the product warranty.

- Do not use the light source and connected endoscope with electrosurgical instruments.

WARNING: Total system risk current should not exceed 50uA. An isolation transformer is required if the total system risk current exceeds 50uA when accessories are interconnected.

CAUTION: The light source is cooled via two vent fans located in the back of the unit. These fans draw air from beneath the light source through the inside and out the back and through the endoscope connector port. Verify the rear of the unit is no less than 6" from a wall and that the source is placed on a hard surface.

- When possible, keep the light source out of patient field. Always remove the light source from patient field while connecting or disconnecting endoscope or proximal camera system.

CAUTION: To ensure patient safety, make sure monitor is outside patient vicinity (6 feet) during use.

Setting Up the VLX-10 Light Source

1. Place the VLX-10 light source onto a hard, stable surface (shelf, counter, cart, etc.) and connect the power cord to the power supply cord receptacle located on the rear panel of the unit. After making sure the main power switch is off, couple the remaining end of the power cord into a properly grounded 115 volt AC outlet.

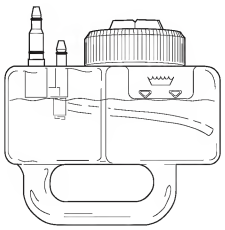
NOTE: The VLX-10 should not be placed in areas where:
- it will be exposed to fluids.
- it will be exposed to flammable gases.
- the vent fans in the rear panel will be blocked.
- the vent holes on the bottom of the unit will be blocked.

WARNING: DO NOT use a converter adapter that will convert the three prong plug to a two prong. In this case the light source is not properly grounded and electric shock may result.

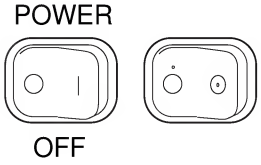
NOTE: Place the light source in a horizontal position for operation.

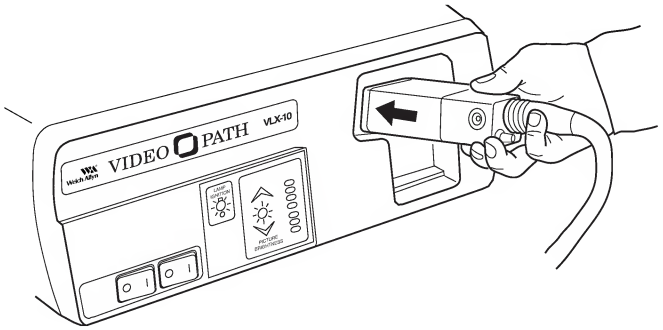
NOTE: If the light source is placed on a mobile cart verify that the cart is stable enough to support the unit.

Connecting the VideoEndoscope and Water Bottle



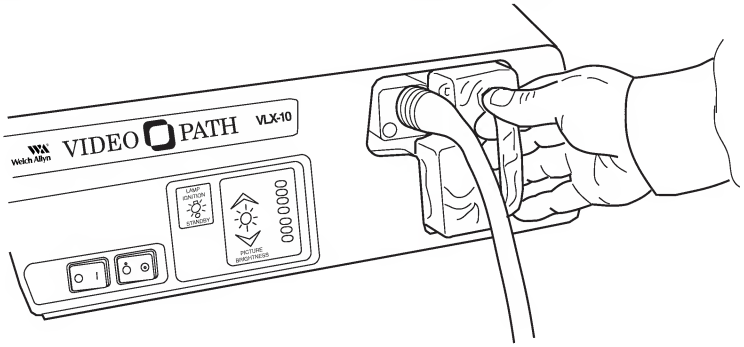
1. Fill the water bottle with clean water to the fill line indicated on the side of the bottle. Remember to:
   - Change the water daily.
   - Use distilled or sterile water to prevent mineral and organic deposits in the water lines.
   - If water leaks from the bottle into the light source, a drain in the base of the endoscope connector port will direct the water to the table top where it can be wiped up.
2. Verify that the light source's main power switch is off. Plug the endoscope connector terminal into the light source's endoscope connector port. Advance until the instrument clicks into place.





Preparation For Use (Continued)

3. Insert the water bottle into the recessed area (endoscope connector port) on the front panel of the light source. The bottle's air and water connectors should couple to the air output port of the light source and air and water input ports on the endoscope connector terminal. Push water bottle until the front of the bottle is flush with the front panel of the light box.



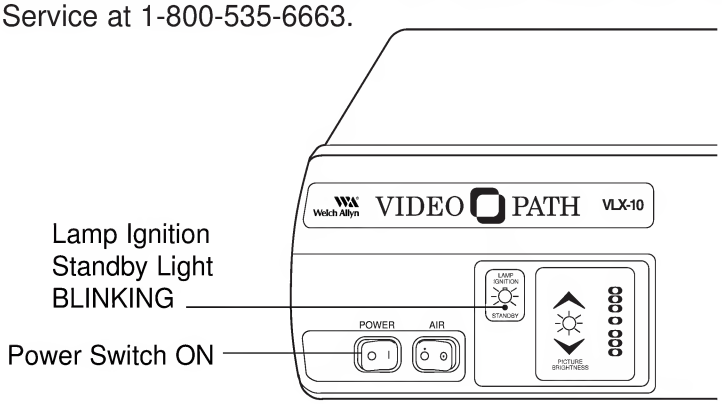
Inspection

Prior to every examination, the equipment should be pre-tested following the procedures outlined in the following sections. If an abnormality is detected or suspected, do not continue with the examination. Contact Welch Allyn Customer Service for assistance at 1-800-535-6663.

Powering Up the Light Source

1. With the instrument coupled to the light source, activate the power switch on the light source's front panel. The internal cooling fans will power up and should be heard running. The green LED Lamp Ignition/Standby light will blink for approximately 11 seconds to allow the lamps to warm up (or if the light source has been on for an extended period of time, to allow the lamps to cool down).

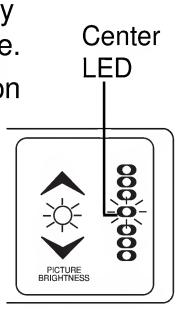
NOTE: If the light source does not appear to power up, make sure that the power cord is correctly connected, the lamp door cover on the bottom of the unit is securely closed and the endoscope connector terminal is correctly engaged in the endoscope connector port. If the unit still does not power up, contact Welch Allyn Customer Service at 1-800-535-6663.



Inspection

Lamp Ignition

1. When the sigmoidoscope is connected to the light source and the main power switch is activated, the green Ignition/Standby light will blink for approximately 11 seconds. Once the green LED stops blinking, the lamps are ready to ignite.
2. Once the green Lamp Ignition/Standby light remains lit, press the Lamp Ignition Switch. The lamps will ignite and the Lamp Ignition/Standby light will go out. The lamps require 11 seconds to warm up. This length of time will be indicated by the center LED of the Picture Brightness Indicator which blinks until the lamps reach full intensity. Once the Picture Brightness Indicator remains constant, the lamps are fully warmed up, and the system is ready for use.



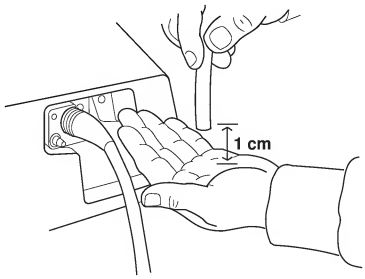
NOTE: If the light source is powered up without the endoscope plugged in, the center LED in the Brightness Indicator Panel will not illuminate, and the lamps will not ignite. The Standby light will continually blink.

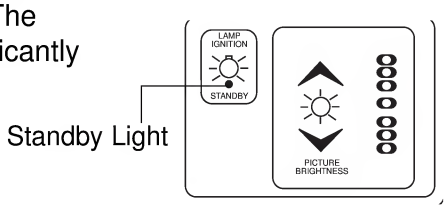
WARNING: If the endoscope is removed from the light source, the lamps will remain lit. DO NOT look directly into the lights. The intensity of the illumination may damage your eyes. If the instrument is removed from the light source, either turn off the main power switch or press the Lamp Ignition/Standby switch to turn off the lamps and put them in a standby mode.

NOTE: If the internal cooling fans are running and the lamp ignition switch is activated but no light is emitted from the distal tip of the endoscope, the lamps are not functioning. This will be indicated by the Service Indicator LED which will be glowing red. Refer to the Troubleshooting and/or Lamp Replacement sections in this manual.

Inspection of Illumination

1. Once you have verified that the endoscope is connected to the light source and the lamps are lit, check that a live image appears on the monitor.
2. Make sure the endoscope's automatic iris is working properly. While watching the monitor, place the distal tip of the endoscope within 1 cm of the palm of your hand and then move it about 10 cm away from your palm. The image brightness on the monitor at both distances should be similar. Point the distal tip toward dim room lights. The light being emitted at the distal end should lower significantly depending on the ambient light levels in the room. Point the distal tip at your palm again to verify that light is being emitted from the endoscope.

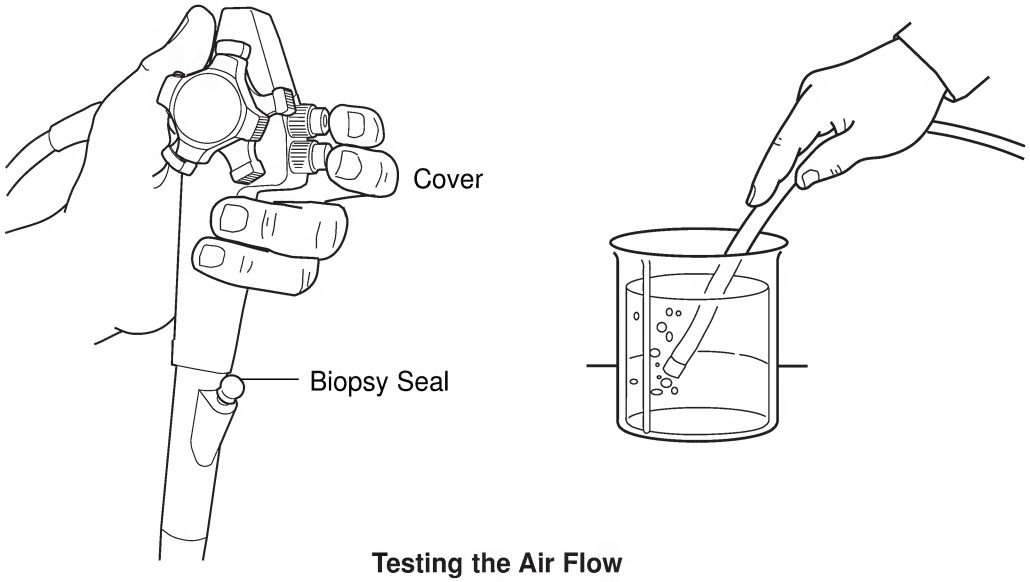




Inspection of Air/Water Feed

1. Turn on the air pump. Once activated, the sound of the air pump should be evident.

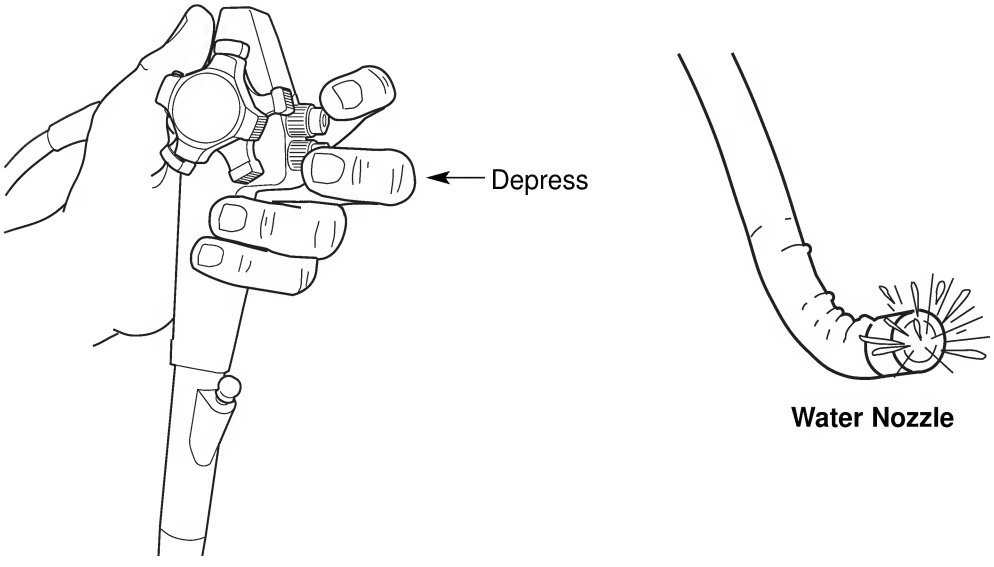
2. Test the Air and Water flow through the endoscope. First, cover the air venting hole on top of the Air/Water valve. This should deliver air at the distal end of the endoscope through the air nozzle. Submerge the distal end in water. Air flow will be demonstrated by a flow of bubbles.



Testing the Air Flow

3. Remove the distal tip from the water and depress the Air/Water valve completely. Water should flow through the water nozzle at the distal tip of the endoscope.

NOTE: Allow 5 seconds for the water lines within the instrument to fill.

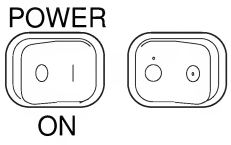


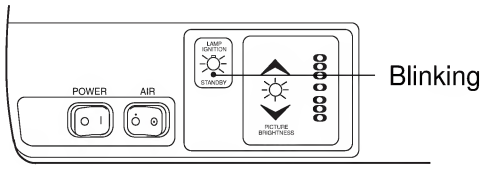
Water Nozzle

Operation

Power Switch

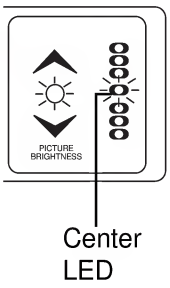
With the endoscope connected to the light box, activate the power switch on the light source's front panel. The green LED Lamp Ignition/Standby light will blink for approximately 11 seconds to allow the lamps to warm up (or if the light source has been on for an extended period of time, to allow the lamps to cool down).





Lamp Ignition

Once the green Lamp Ignition/Standby light remains lit, press the Lamp Ignition switch. The lamps will ignite and the Lamp Ignition/Standby light will go out. The lamps require 11 seconds to warm up. This length of time will be indicated by the center LED of the Picture Brightness Indicator, which blinks until the lamps reach full intensity. Once the Picture Brightness Indicator LED remains constant, the lamps are fully warmed up, and the system is ready for use.



NOTE: Allow the system a full 15-20 seconds to warm up before beginning a procedure or image color will be adversely affected.

NOTE: If the light source is powered up without the endoscope plugged in, the Standby light will continually blink, and the lamps cannot be ignited.

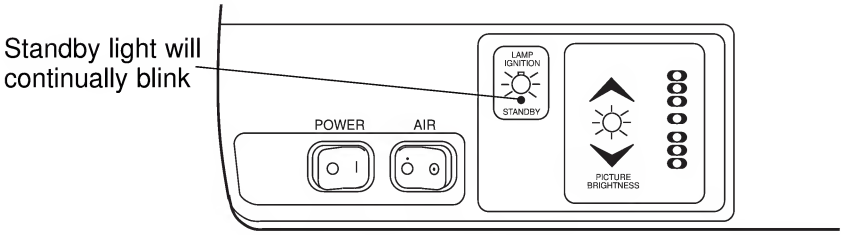
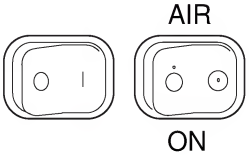


Image Brightness

Picture Brightness: The average brightness of the image on the monitor can be manually adjusted. Press the Picture Brightness Control switch (the up and down arrows). The LED light goes up/down one step with increased/decreased Picture Brightness (viewed on the monitor). Continually depressing the button causes the LED light to go up/down sequentially with increasing/decreasing Picture Brightness until the maximum/minimum output is reached.

Air Pump



Turn on the Air switch.

Maintenance and Storage

Light Box–After Each Procedure

NOTE: Some peripheral devices may have to be turned off before powering down the VLX-10 light source to avoid compromising their operation. Refer to the instructional manuals that accompanied each of the components to determine the proper order in which to turn off the components.

Disconnect the water bottle and endoscope.

Wipe all of the surfaces of the light source with a gauze dampened slightly with alcohol.

NOTE: Never allow liquids to be splashed onto the VLX-10. Do not allow the connector interfaces and ventilation ports to become wet.

Water/Cleaning Bottle–Cleaning

WARNING: As with all endoscopic accessories, the water bottle must be cleaned thoroughly. Failure to do so could result in incomplete or ineffective sterilization.

1. After use, the entire bottle assembly (bottle and cap) should be washed with enzymatic solution and dampened gauze or scrub brush. Use an enzymatic detergent for soiled items.

Enzymatic Solutions

The materials listed below are safe for cleaning the water/cleaning bottles if used according to the manufacturer's instructions for cleaning and in accordance with procedures detailed in the cleaning section of this manual.

Brand Name	Source	Usage
Endozime	The Ruhof Corp.	Follow
Klenzyme	Calgon Vestal Labs	Manufacturer's
Enzy-Clean	Burnishine Products	Instructions
Metrizyme	Metrex Research Corp.	
Enzol	J & J Medical	

2. To access difficult to reach areas, use ultrasonic cleaning. Use an operating frequency of 40 kHz or higher for a period of 5-10 minutes.
3. After washing the bottle with enzymatic solution, rinse and dry thoroughly all of the surfaces of the bottle. Use a gauze or clean, lint-free cloth to dry the surfaces. You may also use compressed air and 70% alcohol to facilitate drying of hard to reach areas.

Water/Cleaning Bottle Sterilization

Make sure the bottle has been thoroughly cleaned prior to ETO sterilization.

NOTE: DO NOT steam sterilize (autoclave) this bottle.

ETO Sterilization

1. Make sure to follow the parameters listed below for ETO sterilization.

Temperature	MUST NOT exceed 55° C (131° F)
Pressure	MUST NOT exceed 1.7 kg/cm2 (24PSI)
Humidity	MUST NOT exceed 50%
Time	MUST NOT exceed 4 hours

2. Following ETO sterilization, aeration time of 72 hours is required. You may use an aeration chamber to shorten the time to 12 hours, but the temperature must be between 49° C (120° F) and 55° C (131° F).

Cold Sterilization

1. After thoroughly cleaning and drying, the water bottle may be soaked in the sterilant for the time period recommended by the manufacturer and accepted by the user as appropriate.

Sterilizing/Disinfecting Solutions

The materials listed below are considered safe for sterilization/disinfection of the water bottle if used according to the manufacturer's instructions for cleaning and in accordance with procedures explained in the disinfecting section of this manual. Make sure that the sterilant manufacturer's instructions for contact time are followed. Each solution and brand may have different times to achieve sterilization.

Solution	Brand Name		Source	Usage
Glutaraldehyde	Cidex (14 day)	(2.4%)	J & J Medical	Follow Manufacturer's Instructions
	Wavicide-01	(2.5%)	Wave Energy System Inc.	
	Metricide (14 day)	(2.6%)	Metrex Research Corp.	

CAUTION: Never exceed the eight (8) hour maximum immersion.

2. Rinse the bottle with clean water, making sure that all of the sterilant is removed from the bottle.

   NOTE: All final rinses should be made with sterile water.

3. Dry the water bottle. Compressed air and 70% alcohol can be used to facilitate drying.

Bottle Storage

Make sure that all water is removed from inside the water bottle assembly prior to storage to reduce the potential for bacteria colonization. Compressed air and 70% alcohol should be used to facilitate drying.

NOTE: Refer to the manual that accompanied your endoscope for cleaning and sterilization procedures.

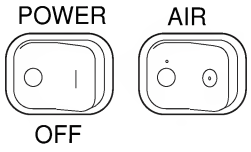
Replacing Lamps

WARNING: Before removing the lamps, allow 5 minutes for the lamps to cool with the internal fans running and lamps off.

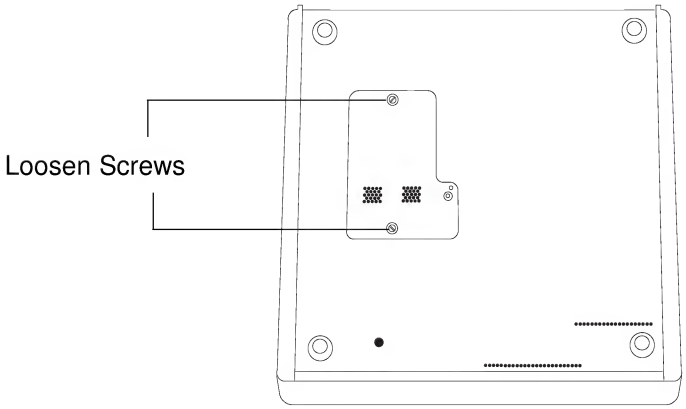
If the lamps need to be replaced, follow the steps below using a Welch Allyn lamp (Part #04060).

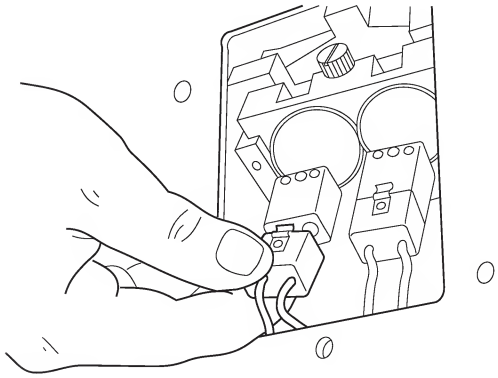
NOTE: If the lamps have been in operation prior to failing, they need to be cooled prior to replacement. This can be achieved by depressing the lamp ignition switch. The standby light will then blink signifying that the lamps are off. Allow the internal fans to run for 5 minutes with the lamps off to cool them prior to replacement.

1. Turn off the power switch to the light source.

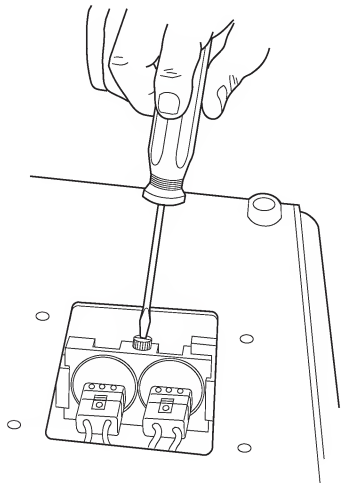


2. Disconnect the power cord from the wall receptacle.
3. Disconnect the power cord from the receptacle on the rear panel of the light source.
4. Remove the water bottle and the endoscope.
5. Turn the light source over on its back on a horizontal surface.
6. Open the lamp access plate on the bottom of the light source by inserting a coin in the slots to loosen the screws.

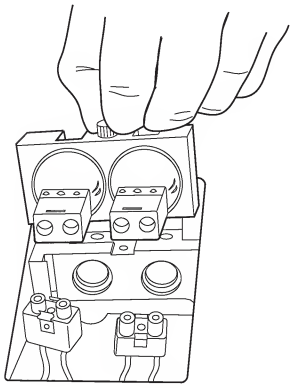




7. Disconnect the lamp electrical connections, located on the back of each lamp, by pulling straight back and slightly up on the plugs.



8. Loosen the lamp plate thumb screw.



9. Lift the lamp plate out.

CAUTION: Do not touch the glass of the lamp during removal or installation. Oils from your fingers can cause the lamp to explode when ignited.

10. Install replacement lamp (Welch Allyn Part No. 04060) in reverse order of removal.

Light Source Storage

- Disconnect the power cord from the receptacle.
- Wipe the external surface of the light source and the power cord with gauze moistened with alcohol.
- Do not store the unit where it can be exposed to liquids.
- Store in a clean, dust-free environment at room temperature. Avoid direct sunlight and areas of high temperature and humidity.
- Do not wind the power cord so tightly that it is permanently crushed, twisted or bent.

Troubleshooting

Condition	Check	Action
Power does not come on.	Power cord	Make sure proper connection at unit and wall outlet.
	Lamp housing door	Make sure lamp housing door is properly closed.
	Fuse blown	Remove fuse panel and replace blown fuse with T2.0A-250V fuse.
	Power socket	Plug the power cord into a socket known to work.
No image on monitor.	Monitor/other peripheral devices	Make sure power is on for all devices.
	Cable connections	Make sure all video cables are connected properly.
	Endoscope	Make sure the endoscope is properly connected.
	Lamp	Make sure the lamps are ignited.
	Monitor Input Selection	Make sure correct input selection is made on the front panel.
Lamps will not light.	Lamp cartridge	Make sure lamp assembly is installed properly.
		Make sure lamps are not burned out.
No air delivery at distal end of endoscope.	Air pump	Make sure the air pump is turned on.
	Water bottle	Make sure the water bottle is properly coupled to the light source.
		Make sure water bottle cap is properly secured.
		Check “O” rings on water bottle for damage.
No water delivery at distal end of endoscope.	Air pump	Make sure the air pump is turned on.
	Water bottle	Make sure the water bottle is properly coupled to the light source.
		Check “O” rings on water bottle for damage.
		Make sure the water bottle is filled to the fill line.

Welch Allyn®

Welch Allyn, Inc.
4341 State Street Road
P.O. Box 220
Skaneateles Falls, NY 13153-0220
Telephone: 315-685-4560
1-800-535-6663

Printed in U.S.A.

Part No. 405071 Rev. D